

WHAT IS CLAIMED IS:

1. A cathode, comprising:
 - (a) an electron injection layer disposed over an organic operative layer of an optoelectronic device;
 - (b) an organic buffer layer disposed over the electron injection layer;
 - (c) a conducting layer disposed over the organic buffer layer;
 - (d) a transparent conductive oxide layer disposed over the conducting layer.
2. The cathode of claim 1, wherein the electron injection layer comprises a layer of LiF adapted to be electrically connected to an organic emissive layer of an organic light emitting device, and a layer of Al electrically connected to the layer of LiF.
3. The cathode of claim 1, wherein the electron injection layer further comprises a layer of Li_2O .
4. The cathode of claim 1, wherein the electron injection layer further comprises a layer of CsF.
5. The cathode of claim 1, wherein the electron injection layer further comprises a layer of alkali metal halide.
6. The cathode of claim 1, wherein the electron injection layer further comprises a layer of alkaline earth metal halide.

7. The cathode of claim 1, wherein the buffer layer further comprises a layer of CuPc.
8. The cathode of claim 7, wherein the buffer layer further comprises a layer of CuPc doped with Li.
9. The cathode of claim 1, wherein the buffer layer further comprises a layer of BCP.
10. The cathode of claim 9, wherein the buffer layer further comprises a layer of BCP doped with Li.
11. The cathode of claim 1, wherein the conducting layer further comprises a layer of MgAg.
12. The cathode of claim 1, wherein the conducting layer further comprises a layer of Ca.
13. The cathode of claim 1, wherein the conducting layer further comprises a layer of LiF and a layer of Al.
14. The cathode of claim 1, wherein the transparent conductive oxide layer further comprises a layer of indium tin oxide.

15. The cathode of claim 1, wherein the transparent conductive oxide layer further comprises a layer of zinc indium tin oxide.
16. The cathode of claim 1, wherein the transparent conductive oxide layer further comprises a layer of aluminum zinc oxide.
17. The cathode of claim 1, wherein the cathode has a transparency of at least 90 %.
18. The cathode of claim 1, wherein the buffer layer does not increase the operating voltage of the device more than about 25% compared to a device having no buffer layer.
19. The cathode of claim 18, wherein the buffer layer does not increase the operating voltage of the device more than about 10% compared to a device having no buffer layer.
20. The cathode of claim 1, wherein the optoelectronic device is an organic light emitting device having an electron transport layer, and wherein the buffer layer has an electron mobility higher than that of the electron transport layer.
21. The cathode of claim 1, wherein the optoelectronic device is an organic light emitting device.

22. The cathode of claim 1, wherein:
- (a) the electron injection layer is in physical contact with the organic operative layer of the opto-electronic device;
 - (b) the organic buffer layer is in physical contact with the electron injection layer;
 - (c) the conducting layer is in physical contact with the organic buffer layer;
 - (d) the transparent conductive oxide layer is in physical contact with the conducting layer.
23. A cathode, comprising:
- (a) a layer of LiF adapted to be physically and electrically connected to an organic operative layer of an organic light emitting device;
 - (b) a layer of Al physically and electrically connected to the layer of LiF;
 - (c) a layer of CuPc physically and electrically connected to the layer of Al;
 - (d) a layer of MgAg physically and electrically connected to the layer of CuPc;
 - (e) a layer of ITO physically and electrically connected to the layer of CuPc.
24. A device, comprising:
- (a) an anode disposed over a substrate;
 - (b) an organic operative layer disposed over and electrically connected to the anode;
 - (c) a cathode disposed over and electrically connected to the organic emissive layer, the cathode further comprising:
 - (i) an electron injection layer physically and electrically connected to the organic emissive layer;

- (ii) an organic buffer layer physically and electrically connected to the electron injection layer;
- (iv) a conductive layer physically and electrically connected to the organic buffer layer;
- (v) a transparent conductive oxide layer physically and electrically connected to the conductive layer.

0393434, 00004
F0000 0457660

25. A method of fabricating a transparent cathode, comprising the steps of:
- (a) depositing an electron injection layer over an organic operative layer of an organic optoelectronic device;
 - (b) depositing an organic buffer layer over the electron injection layer;
 - (c) depositing a conductive layer over the organic buffer layer;
 - (d) depositing a transparent conductive oxide layer over the conductive layer.
26. The method of claim 25, wherein the electron injection layer includes LiF and Al.
27. The method of claim 25, wherein the electron injection layer includes Li_2O .
28. The method of claim 25, wherein the electron injection layer includes CsF.
29. The method of claim 25, wherein the electron injection layer includes an alkali metal halide.

30. The method of claim 25, wherein the electron injection layer includes an alkaline earth metal halide.
31. The method of claim 25, wherein the buffer layer includes CuPc.
32. The method of claim 31, wherein the buffer layer further includes Li.
33. The method of claim 25, wherein the buffer layer includes BCP.
34. The method of claim 33, wherein the buffer layer further includes Li.
35. The method of claim 25, wherein the conducting layer includes Mg and Ag.
36. The method of claim 25, wherein the conducting layer includes Ca.
37. The method of claim 25, wherein the conducting layer includes LiF and Al.
38. The method of claim 25, wherein the conductive oxide layer includes indium tin oxide.
39. The method of claim 25, wherein the conductive oxide layer includes zinc indium tin oxide.

40. The method of claim 25, wherein the conductive oxide layer includes aluminum zinc oxide.
41. A transparent cathode fabricated by the steps of:
- (a) depositing an electron injection layer over an organic operative layer of an organic optoelectronic device;
 - (b) depositing an organic buffer layer over the electron injection layer;
 - (c) depositing a conductive layer over the organic buffer layer;
 - (d) depositing a transparent conductive oxide layer over the conductive layer.

10052-1601